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220276US-154-154-2-PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :  
SYLVAIN BALLANDRAS ET AL. : ATTN: APPLICATION DIVISION  
SERIAL NO: NEW U.S. PCT APPLN :  
(Based on PCT/FR01/02225)  
FILED: HEREWITH :  
FOR: ACOUSTIC WAVE DEVICE :  
COMPRISING DOMAINS OF  
ALTERNATING POLARIZATION

PRELIMINARY AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D.C. 20231

SIR:

Prior to a first examination on the merits, please amend the above-identified  
application as follows:

IN THE CLAIMS

Please cancel Claims 1-18 without prejudice.

Please add new Claims 19-36 as follows:

19. (New) An acoustic wave device comprising:

a layer of ferroelectric material; and

a substrate,

wherein the layer of ferroelectric material lies between a first electrode deposited on a  
surface of the substrate or as a constituent part of the substrate and a second electrode, and

the layer of ferromagnetic material comprises positive first polarization domains and negative second polarization domains.

20. (New) The acoustic wave device as claimed in claim 19, wherein the second electrode is deposited on a surface of the layer of ferroelectric material.

21. (New) The acoustic wave device as claimed in claim 19, further comprising a cover resting on the substrate, said cover having the second electrode, to create a space between said second electrode and the layer of ferroelectric material.

22. (New) The surface wave device as claimed in claim 21, wherein the cover is configured to be removed from the layer of ferroelectric material.

23. (New) The acoustic wave device as claimed in claim 19, wherein the layer of ferromagnetic material comprises unpolarized third domains to influence directivity of the acoustic waves.

24. (New) The acoustic wave device as claimed in claim 19, wherein the first domains and second domains are formed as a series of linear domains.

25. (New) The acoustic wave device as claimed in claim 24, wherein the series of linear domains further include unpolarized domains.

26. (New) The acoustic wave device as claimed in claim 19, wherein the first domains and the second domains are in a matrix arrangement.

27. (New) The acoustic wave device as claimed in claim 26, further including unpolarized domains.

28. (New) The acoustic wave device as claimed in claim 19, wherein the ferroelectric material is lead titanium zirconium oxide.

29. (New) The acoustic wave device as claimed in claim 28, wherein the first electrode is a platinum/titanium alloy.

30. (New) The acoustic wave device as claimed in claim 19, wherein the substrate is made of silicon.

31. (New) The acoustic wave device as claimed in claim 19, wherein the second electrode is made of aluminum.

32. (New) The acoustic wave device as claimed in claim 28, further comprising at least one electrode whose surface is defined by two parameters  $y$  and  $x$  satisfying an equation of  $y = f(x)$ , where  $f$  is a real function.

33. (New) The acoustic wave device as claimed in claim 28, wherein a spatial polarization distribution in a plane of the layer of ferroelectric material follows a geometrical law so that a resulting polarized surface is defined by two parameters  $y$  and  $x$  satisfying an equation  $y = f(x)$ , where  $f$  is a real function.

34. (New) A process for manufacturing a surface wave device as claimed in claim 29, comprising:

producing the layer of ferroelectric material on the surface of the substrate having the first electrode;

forming the layer of ferroelectric material of positive and negative polarization domains by applying an electric field greater than a coercive field of the ferroelectric material, a polarity of which determines a direction of polarization of the domains; and

producing the second electrode opposite the ferroelectric material.

35. (New) The process for manufacturing an acoustic wave device as claimed in claim 34, wherein the second electrode is produced on the surface of the layer of ferroelectric material.

36. (New) The process for manufacturing an acoustic wave device as claimed in claim 34, wherein the second electrode is supported by a cover fixed to the substrate.

#### IN THE ABSTRACT

Please delete the original Abstract on page 13 in its entirety and insert therefor:

#### ABSTRACT

An acoustic wave device including a layer of ferroelectric material and a substrate. The layer of ferroelectric material lies between a first electrode deposited on the surface of the substrate or as a constituent part of the substrate and a second electrode. The layer of ferromagnetic material includes positive first polarization domains and negative second polarization domains. For applications in the field of surface wave transducers, it may be advantageous to produce structures with domain inversion with a pitch of the order of a few hundred nanometers, the structures being suitable for applications at high frequencies (of the order of 1 gigahertz).

#### REMARKS

Favorable consideration of this application, as presently amended, is respectfully requested.

The present Preliminary Amendment is submitted to place the above-identified application in more proper format under United States practice.

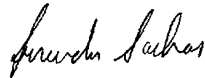
By the present Preliminary Amendment original Claims 1-18 are cancelled and new Claims 19-36 are presented for examination. New Claims 19-36 are deemed to be self-evident from the original disclosure, including original Claims 1-18, and thus are not deemed to raise any issues of new matter. Further, new Claims 19-36 are not believed to be more narrow in scope in any aspect with respect to original Claims 1-18.

A new Abstract believed to be in more proper format under United States practice is also submitted herein.

The present application is believed to be in condition for a full and thorough examination on the merits. An early and favorable consideration of the present application is hereby respectfully requested.

Respectfully submitted,

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IN THE CLAIMS

Claims 1-18 (Cancelled).

Claims 19-36 (New).

IN THE ABSTRACT

Abstract (New).